

Planning Response Team
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Date: 09 March 2021

Dear Sir/Madam,

Planning Application Ref.: LA10/2017/1249/F

Location: Lands NW Of Greencastle E Of Rouskey N Of
Crockanboy Rd W Of Mullydoo Road N And S Of
Camcosy Rd Including Lands 165m W Of No. 45
Camcosy Road To The Junction Of Camcosy Rd And
Crockanboy Rd And Lands 47m To The SE Of 73
Crockanboy Rd

Proposal:

Underground valuable minerals mining and exploration, surface level development including processing plant and other associated development and ancillary works, Greencastle, County Tyrone. Please see application form P1, sheet 1 for full project description. (Revised description and amendments to the planning application, receipt of Further Environmental Information (FEI), other information and updates to the Waste Management Plan (WMP), supporting documents and provision of new and amended drawings).

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Thank you for your consultation on the above which was received by the Department on 19/11/2020.

This letter provides a single combined response for your consultation request across all of DAERA's area of environmental responsibility. Summary comments in relation to the reason for consultation are provided in the table below at Annex A, and, where appropriate, more detailed advice is enclosed and attached to this letter.

You should be aware that, in the absence of comment, no inference can be made on DAERA's position with regard to other environmental matters. It is the responsibility of the planning authority to ensure that all risks to the environment and requirements under environmental legislation and planning policy have been considered.

This advice and guidance will enable you to identify and consider if there are other potential risks to the environment due to impacts from the construction and operation of the proposed development and also its location.

In addition, we would also refer you to DAERA's published advice and guidance on development proposals where there is potential for effects on the natural and marine environments and fisheries interests, available at: <https://www.daera-ni.gov.uk/topics/environmental-advice-planning>.

As the Planning Authority is the competent authority under The Conservation (Natural Habitats, etc.) Regulations 1995 (as amended), this responsibility extends to the carrying out of Habitat Regulations Assessments (HRAs) before a planning decision is made.

Should you require assistance or if you wish to discuss anything further, please do not hesitate to contact the Planning Response Team using the contact details below.

Kind regards.

Planning Response Team

On behalf of DAERA

Email: planningresponse.team@daera-ni.gov.uk

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Annex A

Advice Provided By:	Summary
Water Management Unit and Inland Fisheries	Water Management Unit (WMU) has considered the impacts of the proposal on the surface water environment and would provide the following advice.
Drinking Water Inspectorate	DWI Response in full.
Regulation Unit	Regulation Unit, Land and Groundwater Team (LGW) has considered the impacts of the proposal on the groundwater environment and further clarification is recommended. This is detailed within the explanatory note.
Natural Environment Division	Natural Environment Division require further information.

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Drainage & Water

Planning Reference No.: LA10/2017/1249/F [Dalradian]

Lands NW Of Greencastle E Of Rouskey N Of Crockanboy Rd W Of Mullydoo Road N And S Of Camcosy Rd Including Lands 165m W Of No. 45 Camcosy Road To The Junction Of Camcosy Rd And Crockanboy Rd And Lands 47m To The SE Of 73 Crockanboy Rd

Section Reference: GQ703

The comments below are not exhaustive but serve to capture key points in support of the Drinking Water Inspectorate's (DWI) position. On the basis of the information provided DWI is unable to provide its substantive response until the requested clarifications are addressed. DWI has considered the review completed by an independent expert in preparation of this response. These comments are made on consideration of the documents listed in **Annex 1**.

1.0 Considerations:

1.1 Public Water Supplies

DWI response issued on 24 April 2020 (GQ558) and previously on 05 October 2018 (GQ311) stated: '*In relation to the **public drinking water supply**, the applicant is required to consult with Northern Ireland Water (NI Water), who are the statutory water undertaker, to allow an assessment of any potential risks to drinking water supplies. NI Water has a regulatory obligation, under regulation 30 of The Water Supply (Water Quality) Regulations (Northern Ireland) 2017, to undertake risk assessments of all aspects of its drinking water supply systems from catchment through to consumers' taps. The applicant should provide all necessary data and models to allow NI Water to assess these within its risk assessments in relation to any potential impact on the management of its drinking water abstractions. The proposed development should not adversely impact on Drinking Water Protected Areas established under Article 7 of the Water Framework Directive.*' DWI could not find any specific reference to an assessment of these designations within the FEI2 dated October 2020.

1.2 Private Water Supplies

The Drinking Water Inspectorate (DWI) has considered the application in relation to private water supplies used in the supply of drinking water. DWI notes the information provided in the applicant's Further Environmental Information (FEI2), dated October 2020 and has assessed this information against our previous consultation responses issued on the 5 October 2018 (GQ311) and 24 April 2020 (GQ558). On the basis of the additional information provided, DWI has identified a number of areas for clarification outlined within the Explanatory Notes.

The Explanatory Notes detail where information requires clarification together with further information requests.

2.0 Explanatory Notes:

2.1 Public Water Supplies

2.1.1 Previous consultations (GQ311 & GQ558)

The applicant stated that the '*Project area or potential groundwater impact area does not contain any public water supplies or intersect any source protection zones (appendix C6*

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section 4.5). However, all groundwater bodies in NI are designated as Drinking Water Protected Areas under Article 7 of EFD (2006/EC). The model files for the groundwater and surface water models are provided as Appendix D3. Private water abstraction data is provided as Appendix D4.'

Applicant's Updated Responses

UK7511 – Clarification to the Environmental Statement Addendum – 6 April 2020

The applicant stated that '*the Surface Water Impact Assessment complies with the requirements of Drinking Water Protected Areas, with no impact on water quality or stream flows that would affect such areas. Drinking Water Protected Areas within the study are governed by the Water Framework (WFD) Regulations (Northern Ireland) 2017.*'

FEI2 – October 2020

The applicant states that '*neither the project application area nor the wider groundwater study area contains any groundwater based public water supplies or intersect any groundwater source protection zones.*' (FEI2 App C6). This document and FEI2 App D2 both refer to NIEA's Water Management Unit's response dated 24 February 2016 '*that all groundwater bodies (except Neagh groundwater body) are designated as Drinking Water Protected Areas under Article 7 of WFD (2000/60/EC).*'

DWI further comment: DWI highlights that the applicant's response within FEI2 relates to groundwater, which is not used for the **public water supply** in this area. Although the clarification had been provided by the applicant in April 2020, DWI were unable to locate a summary of any assessment made on Drinking Water Protected Areas [designated bodies under Water Framework Directive 2000/60/EC Article 7] within the updated FEI2. FEI2 App C4 Surface Water Impact Assessment Oct 2020 (Section 8 Legislative and Regulatory Context; 8.1 Water Framework Directive), makes no reference to the site being within a Drinking Water Protected Area, or makes any reference to the consideration of the information submitted by NI Water on surface water sources used for the abstraction of the public water supply. It would be beneficial for the applicant to clearly specify that the site is within a Drinking Water Protected Area within the FEI2.

DWI notes NI Water's written responses to the planning application as follows:

05 April 2019, which stated '*the proposed development is within the drinking water catchment area for Derg WTWs...If an activity falls within a DWPA or drinking water catchment, it is essential that water quality and quantity is protected.*'

02 December 2019, which stated '*The area under consideration for the proposed development is within the drinking water catchment areas for a number of NI Water's Water Treatment Works (WTWs) and drinking water abstraction points. These drinking water catchments have been designated as a Drinking Water Protected Area (DWPA) under Article 7 of the Water Framework Directive. Any development carried out within a DWPA must demonstrate measures to ensure water quality and quantity are protected.*'

Following the applicant's most recent response after NI Water's request for clarification, (01 April 2020, ES Addendum Clarification NI Water Letter Final), the applicant indicated that there are no public water supply abstraction points within 5km of the application site. NI Water indicated (24 July 2020), that a number of points had been addressed within this clarification document, but indicated that it had furnished the applicant with details of water intakes within the affected catchment area to enable the applicant to provide a definitive response on each.

The applicant should engage with NI Water on its current and any future responses in considering the locations and potential impacts on surface water sources used for

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abstracting the public water supply. A development should not impact on the quality or sufficiency of the public water supply.

2.1.2 DWI Comment EN 08 – (GQ311 & GQ558)

Further details are required in the form of assessments and models, to demonstrate the activities undertaken during all stages of this development will not negatively impact on drinking water catchments (Drinking Water Protected Areas) and abstractions through a reduction in the established water quality. If there are potential risks identified then suitable mitigation measures should be proposed, along with monitoring (including baseline monitoring) where this is appropriate. The Drinking Water Inspectorate was unable to find such assessments within the current Environmental Statements. The applicant should provide all necessary data and models to allow NI Water to assess these within its risk assessments in relation to any potential impact on the management of its drinking water abstractions. The proposed development should not adversely impact on Drinking Water Protected Areas established under Article 7 of the Water Framework Directive, DWI could not find any specific reference to an assessment of these designations within the report.

Applicants Response EN 08: See responses to 1.2 [See Applicants Response: **Considerations** Point 2 Public Water Supplies] and 1.8 [See Applicants Response: EN 06] above. Data and models are provided to DWI through FEI requests 2.3 (WMU) and 5.2 (NIEA RU – L&G). Further information on private abstractions is provided under FEI request 1.8 (DWI).

DWI further comment: As referred to in 2.1 the applicant submitted Clarification to the Environmental Statement Addendum (April 2020), within which it is stated that *'the Surface Water Impact Assessment complies with the requirements of Drinking Water Protected Areas, with no impact on water quality or stream flows that would affect such areas. Drinking Water Protected Areas within the study are governed by the Water Framework (WFD) Regulations (Northern Ireland) 2017.'* This should be reflected within the impact assessments and modelling reports to ensure the modelling complies with the requirements of Drinking Water Protected Areas.

DWI will continue to engage with NI Water to provide an independent assurance on the safety of the public drinking water supply.

2.2 Private Water Supplies

2.2.1 DWI Comment EN 03 - (GQ311 & GQ558)

When assessment is made of potential limits on outputs from the site suitable warning or trigger values should be used in the management of monitoring programmes and to ensure actions are implemented in advance of any potential threat to drinking water quality. A threat to drinking water quality is considered as being where the outputs from the site would breach Article 7 of the Water Framework Directive. Consideration should be given to any potential increase of chemical loadings over time against the current background levels. The Company should engage with NI Water and NIEA on the established Drinking Water Protected Areas (DWPAs) to gather information on baseline levels for these parameters and to ensure the processes and any discharges from the site will not impact negatively on the water quality within these catchments.

In developing monitoring plans cognisance should be given, in the first instance, to the regulatory drinking water standards (see above) and secondly to the drinking water

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standards set within the World Health Organisation Guidelines for Drinking-Water Quality¹ or any subsequent amendments or revisions.

DWI further comment: Clarification was sought on how Assessment Limits are calculated in respect of private groundwater abstractions.

Applicant's response: The applicant has identified that groundwater design target limits have been set for both groundwater quality and levels, referred to as 'Assessment Limits' within Clarification to the Environmental Statement Addendum (April 2020) and FEI2 App C6 (October 2020). The assessment limits are designed to be used in future monitoring to provide an early-warning mechanism before any compliance limits are reached at private groundwater abstractions. The applicant has indicated that assessment limits will provide an indication of unexpected trends in the receiving environment and provide time to initiate actions to ensure compliance limits are not breached.

DWI welcome the adoption of assessment limits to monitor trends, however clarification is required on the mitigations and actions that would be employed in a timely manner, should an unexpected trend in the receiving environment be identified to ensure private groundwater abstractions are not adversely affected.

2.2.2 DWI Comment EN 06 - (GQ311 & GQ558)

DWI's previous comments and the applicant's responses related to the Ground Water Impact Assessment – Hydrogeology Impact Assessment (U6193). FEI2 App C6 – Groundwater Impact Assessment (2020) supersedes the 2017 document. In consideration of Clarifications to ES Addendum (April 2020) and the updated FEI2 (October 2020), DWI has reviewed Comment EN06 and considers the following to be of continued relevance:

DWI notes the information provided in Appendix D4 and the GIS shape file as detailed [File Ref: 20190801_PrivateWaterSupplies.rar]. The applicant has identified the private water supply abstractions within the boundary of the site and in the surrounding area (App D4). 30 abstractions were identified as currently in use (13 domestic, 13 agricultural and 4 multiple); 3 were planned for use; 20 were not operational and 8 were unknown use. The identified use of a number of these and the associated risk assessment of the impacts from mine activities have been identified, however DWI notes water level impacts have yet to be determined on a number of wells and further information is needed on well depths.

The impact of mine dewatering on private water abstractions has been presented and identifies well depth as an influencing factor. Results from the groundwater modelling (FEI2 App C6 Annex D) indicates that *'wells with an assumed depth of 200m show the greatest variability of drawdown impacts. Results show that the depth of the well is as important as proximity to the mine when assessing the drawdown impacts due to mining.'*

The applicant has identified that *'Additional mitigation is required in the form of i) obtaining, where possible the depths of private abstraction wells whose depths are currently unknown, and ii) a commitment by the developer to replace any abstractions significantly derogated by the operation.'* (FEI2 App C6). The applicant has identified in their assessment of private water abstractions, two shallow wells near the underground mine development that could be impacted by drawdown and may go dry. These abstractions will be monitored and, should losses occur due to mining activity, DGL will offer replacement if requested by the landowner. Six other abstractions listed as 'used' (ie active) are predicted to have water level drawdown but not go dry. Two of these are on DGL land and will be removed as part of the

¹ [World Health Organisation Guidelines for Drinking-Water Quality](#)

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development. The remaining abstractions will be monitored during mine operation and replacement supplies will be offered if required.

An updated Appendix D should be provided following a more intensive assessment of well depths and specific abstractions that will be impacted.

As previously highlighted by DWI, a mitigation measure offering a replacement source should only be offered where there is no breach of the Groundwater Regulations (Northern Ireland) 2009 (as amended), and on prior agreement with the owner of the private water supply. DWI notes information provided in Appendix D4 (footnote) which states 'The groundwater model used for these predictions incorporates *the 2017 EIA mine design. The 2019 underground mine design is larger in the west of the extraction area, therefore predicted impacts to supplies ID 11 and 56 are expected to increase*' appropriate monitoring and mitigations should be put in place to limit any impacts on these supplies.

DWI acknowledge that the applicant provided Clarifications to ES Addendum (April 2020 - Ref 3.). This provided clarification on when a baseline assessment will take place for water quality and water levels prior to start of construction. It was advised that this should accommodate seasonal variations including wet and dry periods. The applicant stated that *Monitoring of groundwater abstractions will be offered to private land owners once planning permission is granted. Access permitting, samples and well depths will be tested at least quarterly during the two year construction period. This will allow adequate sampling during the construction phase to determine a baseline characterisation prior to the commencement of the operational phase.*

DWI also note that monitoring and action plans have been provided within FEI2 - Surface Water and Groundwater Environmental Monitoring and Action Plan (October 2020 Draft (Version 2)). Details of monitoring programmes is required (location, frequency, and scope) to monitor and confirm drinking water quality (to include baseline monitoring of relevant drinking water standards), and in confirming the sufficiency of supplies. The additional mitigation measures referred to in FEI2 App C6 respect to monitoring of used abstraction wells in terms of usage (pumping rate) and water quality should also be included in the baseline monitoring prior to construction.

If not already in the risk assessment programme the following private water supplies which are registered with DWI under the Private Water Supplies Regulations (Northern Ireland) 2017, in Table 1, should as a minimum be included in this. The applicant is requested to provide DWI with the equivalent ID number for the following private abstractions

Table 1

DWI Site ID	Grid Reference
FO012Y	258694E 384453N
FO013Y	260071E 385327N
FO017Y	259842E 382896N

The applicant has concluded that properties with private water abstractions are not expected to be significantly impacted by mine dewatering activities, once mitigation is applied. Given the considerations outlined above, DWI request the applicant to implement the additional mitigations referred to in FEI App C6 in relation to well depths and provide the results to DWI to include detailed information on the specific private groundwater abstractions at risk of either running dry or impacted by mine dewatering. DWI also request clarification that the applicant has made all reasonable attempts to engage with relevant owners and/or users of these supplies to advise them of potential impacts.

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2.3 General Comments

Updated considerations are provided below for issues raised by DWI in previous consultation responses (DWI GQ311 - 05 October 2018 and GQ558 - 24 April 2020).

2.3.1 DWI EN 01 - (GQ311 & GQ558):

At the time of the report (ES Vol 3 – C3), the drinking water quality regulations quoted were from 2007 (as amended). Since the publication of the report new regulations² are now in place from October 2017. These new regulations do not change the drinking water quality standards but should be quoted in future reports for consistency.

DWI further comment: FEI2 still refers to previous regulations therefore the point remains valid, the 2017 regulations should be quoted in future reports as the 2007 regulations have been revoked.

2.3.2 DWI Comment EN 02 - (GQ311 & GQ558):

Table 3-29 (ES Vol 3 – C3) details project guideline values. These guidelines are considered against the regulatory drinking water standards, where there is no regulatory standard for a parameter under assessment then consideration should be given to the use of the World Health Organisation Guideline values for Drinking Water e.g. for barium a value of 1.3 mg/l should be considered.

DWI further comment: The above statement remains valid where applicable in the consideration of project guideline values.

2.3.3 DWI Comment EN 04 - (GQ311 & GQ558)

Note table 3-29 (Page 70) has a project guideline level of 730 mg/l for molybdenum, this would seem to be a typo and should read 0.073 mg/l as detailed in CCME, this equates to WHO guideline level of 0.07 mg/l.

DWI further comment: DWI accept the applicant's previous response advising it was a typographical error. The updated FEI2 reflects the correct value. **DWI is content to close this comment and remove from further responses.**

2.3.4 DWI Comment EN 05 - (GQ311 & GQ558)

The applicant should future proof against potential changes to drinking water standards and note the current European Commissions consultation on the Recasting of the Drinking Water Directive which is currently ongoing.

DWI further comment: DWI note the applicant's reference to the DWD recast made with respect to changes to the lead standard (from 10 µg/l to 5 µg/l) (FEI2 App C4). DWI draws the applicant's attention to other areas of the Drinking Water Directive Recast³ which includes a number of new regulatory parameters (eg, uranium), and changes the parametric values for a number of other parameters (eg total chromium reduces from 50µg/l to 25µg/l).

² [The Water Supply \(Water Quality\) Regulations \(Northern Ireland\) 2017](#)

[The Private Water Supplies Regulations \(Northern Ireland\) 2017](#)

³ [Drinking Water Directive Recast](#)

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The examples provided are not exhaustive and the applicant is advised to consider any potential impacts of the revised standards over the life of the mine.

2.3.5 DWI Comment EN 07 – (GQ311 & GQ558)

Table 6-10 (page 80) Prediction concentrations for separated paste and waste risk with 5% binder – Note the column NI Drinking Water Guideline Values are not all based on the standards within the 2017 drinking water quality regulations (e.g. As is given as 0.05mg/l whereas the drinking water standard is 0.01mg/l). The company should review, where appropriate, its use of drinking water guideline values to ensure they are comparable to those contained in the current legislation.

Applicants Response: The use of an arsenic drinking water standard of 0.05mg/L was a typographic error in this section of the ES and table 6-10 of the Groundwater Impact assessment. Elsewhere in the report (i.e., ES, 2017 Appendix C4 – Surface Water Impact Assessment and both the baseline reports for surface water and groundwater) the correct arsenic standard (0.01mg/L) was stated. This value is not used in the groundwater risk assessment as a target concentration, therefore the typo is not of consequence to the assessment.

DWI further comment: DWI accept the applicant's previous response advising it was a typographical error. The updated FEI2 reflects the correct value. **DWI is content to close this comment and remove from further responses.**

2.3.6 Other consultation responses

In order to save on repetition of issues to be addressed, DWI endorses the Regulation Unit's, Land and Groundwater Team's Response [**Section Ref: AE1/21/138449**] and clarifications should be addressed in relation to groundwater monitoring that may impact on private water supplies as highlighted within that response.

On clarification on the points above, and satisfactory engagement with NI Water, DWI will review any conditions in relation to the application.

Documents considered in this response

- A. SRK Consulting: Curraghinalt Gold Project Addendum to Environmental Statement, Prepared for Dalradian Gold Limited; dated July 2019;
- B. SRK Consulting: Updated Environmental Statement (2) Vol 3; Appendix C6, Annex A: Groundwater Baseline Report for the Curraghinalt Project, County Tyrone, Northern Ireland, prepared for Dalradian Gold Limited; dated October 2017;
- C. SRK Consulting: Updated Environmental Statement (2) Vol 3; Appendix C6, Annex D: Numerical Groundwater Model Report for the Curraghinalt Project, prepared for Dalradian Gold Limited; dated October 2020;
- D. SRK Consulting: Curraghinalt Project County Tyrone; Prepared for Dalradian Gold Limited, An Addendum to the Hydrogeology Baseline Report for the Curraghinalt Gold Project, Northern Ireland; dated July 2019;
- E. SRK Consulting: Updated Environmental Statement (2) Vol 3; Appendix C3, Second Addendum to the Surface Water Baseline Report for the Curraghinalt Gold Project, Northern Ireland, prepared for Dalradian Gold Limited; dated October 2020;
- F. SRK Consulting: Updated Environmental Statement (1) Vol 3; Appendix D4, Private Water Supply Information; dated July 2019;
- G. SRK Consulting: Environmental Emergency Preparedness and Response plan protocol for the Curraghinalt Project, County Tyrone, Northern Ireland; Prepared for Dalradian Gold Limited; dated July 2019
- H. SRK Consulting: Letter entitled “RE: UK7511 – Clarifications to the Environmental Statement Addendum – DAERA Land and Groundwater Team”; Dated 06 April 2020. Clarification Questions Ref no. 1 – 5.
- I. SRK Consulting: Curraghinalt Gold Project Second Addendum to Environmental Statement, Prepared for Dalradian Gold Limited; dated October 2020;
- J. SRK Consulting: A Geochemical Characterisation Report for The Curraghinalt Gold Deposit, Northern Ireland; Prepared for Dalradian Gold; dated October 2020. (Appendix C of 2020 Mine Waste Plan);
- K. SRK Consulting: Groundwater Impact Assessment for The Curraghinalt Gold Deposit, Northern Ireland; Prepared for Dalradian Gold; dated October 2020. (Appendix I of 2020 Mine Waste Plan);
- L. SRK Consulting: Surface Water Impact Assessment for The Curraghinalt Gold Deposit, Northern Ireland; Prepared for Dalradian Gold; dated October 2020. (Appendix J of 2020 Mine Waste Plan);
- M. SRK Consulting: Surface Water and Groundwater Environmental Monitoring and Action Plan October 2020 Draft (Version 2) Curraghinalt Project; Prepared for Dalradian Gold; dated October 2020. (Appendix K of 2020 Mine Waste Plan); (- FE12 App D2 Draft SW and GW Environmental Monitoring and Action Plan Oct 2020)
- N. RPS: Addendum to the Assessment of Radon Gas and Norm Emission Impacts, dated July 2019;
- O. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN PROPOSED CURRAGHINALT PROJECT GROUNDWATER MODELLING REVIEW”, dated 27th January 2021, to Graeme Walker, Department for Infrastructure, From Peter Corrigan.

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- P. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN PROPOSED CURRAGHINALT PROJECT – WATER BALANCE REVIEW”, dated 28th January 2021, to Graeme Walker, Department for Infrastructure, From Peter Corrigan.
- Q. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN PROPOSED CURRAGHINALT PROJECT PHREEQC MODELLING REVIEW”, dated 27th January 2021, to Graeme Walker, Department for Infrastructure, From Peter Corrigan.
- R. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN PROPOSED CURRAGHINALT PROJECT SURFACE WATER QUALITY REVIEW”, dated 1st February 2021, to Graeme Walker, Department for Infrastructure, From Trevor Montague.
- S. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN DSF AND POND SEEPAGE REVIEW COMMENTS” dated 27th January 2021, to Graeme Walker, Department for Infrastructure, From Peter Corrigan.

Water Management Unit

Section Reference: WMU/PC/ 28851-3

Considerations:

Water Management Unit (WMU) has considered the impacts of the proposal on the surface water environment and would provide the following advice.

Explanatory Note:

WMU notes the clarifications received in relation to our previous response WMU/PC/ 28851-2.

The following response provides comment on the following areas:

- Statutory Permissions;
- Closure;
- Peat/ DSF Stability;
- Peer review.

The following paragraphs are numbered for future ease of reference.

1. Statutory Permissions

- 1.1 Applications have been made to NIEA by Dalradian Gold Ltd for two consents to discharge, in accordance with the Water (Northern Ireland) Order 1999, to support the activities proposed under this planning application.
- 1.2 The process to determine these applications is currently ongoing and will consider in detail the impact of the discharges on the receiving water environment and, if appropriate, the setting of suitable consent standards.
- 1.3 A discharge consent is required for any potentially polluting discharges to the aquatic environment and depending on circumstances may be required for site drainage during the construction phase and may be required for a number of additional discharges during the operational/closure phase of the development.
- 1.4 Applications have also been made to NIEA by Dalradian Gold Ltd for two abstraction licences, one to abstract surface water and one to abstract groundwater, in accordance with the Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006. The process to determine these applications is currently ongoing and will consider in detail the impact of the abstractions on the water environment.
- 1.5 The processing and determination of these environmental authorisations, discharge consents and abstraction licences, is not currently at a sufficiently advanced stage for

WMU to make a substantive comment on the proposed discharge and abstraction related elements of the proposed development, as part of this planning consultation.

2. Closure

2.1 In the post closure phase, should the application be approved, the main impacts on surface waters will be from:

- Seepage from the DSF at the proposed infrastructure site; and
- Adit flows and groundwater at the existing surface infrastructure site.

2.2 The applicant has stated that it is their intention, at the existing infrastructure site, to use a reverse osmosis water treatment plant during the operational phase which will continue to be operated into the closure period until it has been demonstrated that water from the adit will be able to be discharged without further treatment or passive treatment systems can ensure the agreed discharge standards can be met.

2.3 Seepage from the DSF, at the proposed infrastructure site, may also require a similar arrangement of active and passive treatment systems being utilised during the post closure period.

2.4 The applicant has stated that it is their intention that a Closure Plan for the mine will be developed and updated through the life of the mine, informed by data collected during mine operations. This will include consideration of active or passive treatment requirements for surface water leaving the existing or proposed infrastructure sites.

2.5 The operation of active treatment measures during the post closure period will require the operation and maintenance of suitable treatment infrastructure. The implementation of a suitable passive treatment solution will also require ongoing operational oversight and regular monitoring and maintenance. Both of these options, or a combination of them, are likely to be required for a significant number of years during the post closure period.

2.6 In relation to groundwater quality, during the post closure period, a potential mitigation measure has been proposed by the applicant should monitoring indicate groundwater quality is breaching compliance limits. This mitigation measure would likely involve passive drainage methods that encourage increased drainage from targeted levels of the underground mine. This would be achieved by drilling sub-horizontal passive relief drains to target mine areas. Mine water arising to surface would need to be collected and treated through a passive or active treatment system, prior to discharge to surface waters, which will require ongoing operational oversight and regular monitoring and maintenance.

2.7 To maintain ongoing water quality monitoring and to ensure suitable treatment facilities are in place, maintained and monitored at the site during all phases of the development and in all eventualities, an appropriate Financial Guarantee must be in place, in accordance with The Planning (Management of Waste from Extractive Industries) Regulations (Northern Ireland) 2015.

3. Peat / DSF Stability.

3.1 An area of potential risk is peat instability, as a result of activities on site, or instability in the proposed DSF. Any such instability could have the potential to cause a serious impact on the surface water environment. WMU however are not the competent authority to comment on any stability issues relating to either peat or the DSF. The planning case officer should ensure that due cognisance has been given to potential stability issues in both the peat and DSF by the relevant competent authority.

4. Peer Review

4.1 The surface water and groundwater aspects of the Mining Waste Management Plan, as with the Environmental Statement, are underpinned by a number of groundwater and surface water models which have been used to assess the potential environmental impacts of the proposed development on groundwater flows, geochemistry and water balance. These models include (list not exhaustive):

- Modflow including FlowSource extension
- PHREEC + Excel
- GoldSim + associated stochastic equations

4.2 To support NIEA's advice to DfI Planning, an independent peer review of the surface water modelling and key assumptions has been carried out by Golders Associates, under contract to DfI Planning.

4.3 NIEA has received and considered the findings of the reports of the independent peer review conducted by Golders Associates. The following reports directly related to the surface water environment have been considered by WMU.

- DALRADIAN PROPOSED CURRAGHINALT PROJECT SURFACE WATER QUALITY REVIEW (Golders Associates, 5 March 2021)
- DALRADIAN PROPOSED CURRAGHINALT GOLD MINE PROJECT - WATER BALANCE REVIEW (Golders, 8 March 2021)
- DALRADIAN DSF AND POND SEEPAGE REVIEW COMMENTS (Golders, 5 March 2021)

4.4 WMU would direct the Planning Case Officer to the comments of our colleagues in NIEA Regulation Unit, Land and Groundwater Team, for any comments they may have in relation to the reports generated by the independent peer review regarding the PHREEQC Modelling Review and Groundwater Modelling Review.

4.5 WMU notes that the Reports are broadly supportive of the conclusions expressed in the relevant impact assessments, presented within the Environmental Statement, and that the modelling is sound and fit for purpose.

- 4.6 However, Golders have identified a number of issues which should/could be addressed to improve the robustness of the models. Golders have acknowledged that the current absence of these points being addressed, at this stage, does not call into question the validity of the modelling outcomes. The issues identified by Golders can be broadly categorised into 3 main areas:
- i. Issues that require additional assessment e.g. modelling of the design/performance of the DSF over its life;
 - ii. Issues that are considered 'best practice';
 - iii. Issues considered helpful or useful to provide increased clarity.
- 4.7 A summary of the issues, identified by Golders, has been provided in Tables 1, 2 & 3 below. However it will be necessary for the applicant to be directed to the full Reports provided by Golders.
- 4.8 Whilst Golders have suggested a number of these issues could be addressed at the detailed design stage, this approach may require the use of negative planning conditions. Given that this application is to be subject to a public inquiry, it is WMU's view that these issues should be addressed, as far as practicable, prior to a public inquiry hearing.

Table 1		
DALRADIAN PROPOSED CURRAGHINALT PROJECT SURFACE WATER QUALITY REVIEW (Golders Associates, 5 March 2021)		
No:	Golders Doc Ref:	Issue
1	3.2.1	<p>Conceptual Site Models</p> <p>No Conceptual Site Models were provided for closure or current conditions. The applicant should consider the provision of a Conceptual Site Model to illustrate the anticipated changes during both current (operation) or closure at this stage.</p>
2	3.2.3.1	<p>Backwards" modelling.</p> <p>The inputs for Arsenic, based on the snapshot of the RQP model inputs/ results, show the mean quality and standard deviation for the upstream river data to be 0.15 µg/L and 0.2 µg/L, respectively. However, the mean quality and standard deviation for the baseline data is 0.56 µg/L and 0.36 µg/L, respectively, resulting in a maximum allowable discharge concentration of 191 µg/L (as opposed to the 203 µg/L reported). However, as the drinking water standard of 10 µg/L is assigned for Arsenic in the "forwards" calculations, this discrepancy appears to have no bearing on the results.</p>

		<p>However this is not the case for mercury. The results of the “backwards” calculations for Mercury (presented in Table 3-2) indicate a maximum allowable discharge concentration of 0.094 µg/L. This result cannot be corroborated as based on the snapshot of the RQP model inputs/results, the mean quality (based on 95%ile values) for the discharge data is 0.0058 µg/L, which is different from the baseline (95%ile) values reported of 0.005 µg/L (Table 3-1).</p>
3	3.2.3.3	<p>Events in Excess of Design Conditions</p> <p>For the modelling of impacts on the Owenreagh River during events in excess of design conditions, the water quality in the ponds was ascertained through transport modelling in GoldSim (“Curraghinalt_WB_Oct_2020_Monthly_FINAL_Base_WQ.gsm”), using the same hydrologic inputs and simulation settings as in the base model.</p> <p>Golder has reviewed the water quality simulations in the GoldSim model file “Curraghinalt_WB_Oct_2020_Monthly_FINAL_Base_WQ.gsm”, with the following observations:</p> <ul style="list-style-type: none"> • Source term water quality for surface runoff from active areas of the DSF: The solute concentrations shown in Table 9-25 of the “Surface Water Impact Assessment for the Curraghinalt Gold Project, County Tyrone, Northern Ireland” do not match the values implemented in the GoldSim model for some of the parameters (e.g. Cl, F, SO₄, Al), also some parameter values in Table 9-25 do not match the geochemical modelling results reported in the 2020 Geochemical Characterisation Report. The impact of these discrepancies on modelling results is expected to be minor, because the concentrations in DSF runoff predicted by geochemical modelling are much lower than those predicted for DSF seepage and underground mine water, and DSF runoff is only a minor component of the pond water balance. • Source term water quality for runoff from the mine site area: The report states “Given the low concentrations of runoff over the active DSF (which would be considered as representative of runoff over exposed mine waste material), runoff concentrations from these areas of the mine are set to Pollanroe baseline water quality.” Golder notes that this is a conservative assumption for all parameters except total ammonia and nitrate, for which concentrations are significantly higher in active DSF runoff than in the Pollanroe baseline.
4	3.3	<p>Assessment of associated levels of uncertainty</p> <p>The scoping assessment provides some insight in the potential sources of uncertainty to the impact assessment, however, there is no discussion</p>

		<p>regarding potential sources of uncertainty in the modelling exercise. Several sources of uncertainty have been identified based on the review of the “Surface Water Impact Assessment for the Curraghinalt Gold Project, County Tyrone, Northern Ireland” report including:</p> <ul style="list-style-type: none"> • Flows in the receiving water body; • Discharge flows from the mine site; • Baseline WQ (in receiving water bodies); • WQ of source terms for mine water discharges. <p>Some discussion on the levels of uncertainty in inputs and outputs, and the implications of these uncertainties would be helpful in order to increase the robustness of the model results.</p>
5	3.4	<p>Assessment of sensitivity analysis of the inputs and outputs</p> <p>The assessment of East and West Pond water quality in the GoldSim model is based on estimates of water flows and water quality of different source terms, all of which have associated uncertainties. It is considered good practice to carry out a sensitivity analysis regarding both flows and qualities to assess their effects on the calculated pond water qualities.</p>
6	4.2.1	<p>Conceptual Site Model</p> <p>No conceptual site models were provided for closure. Golder’s noted that while it would be useful for a CSM to be provided to illustrate the anticipated changes during closure, enough information was presented within the “Surface Water Impact Assessment for the Curraghinalt Gold Project, County Tyrone, Northern Ireland” to facilitate their understanding of the site water interactions during closure to allow the assessment to be undertaken.</p>
7	4.2.2.1	<p>Owenkillew Catchment</p> <p>The RCP 4.5 climate scenario was considered in all dilution calculations. Golder notes that no climate change assessment was carried out for the RCP 8.5 climate scenario. While Golder is not aware of any regulatory requirement to consider the RCP 8.5 scenario, it would be considered best practice to consider this scenario in the next phase of design (subject to planning approval) to (i) better understand the potential range of surface water concentrations during closure, and (ii) reflect the uncertainty inherent in climate change predictions.</p>
8	4.2.2.2	<p>Owenreagh Catchment</p> <p>The RCP 4.5 climate scenario was considered in all dilution calculations. Golder notes that no climate change assessment was carried out for the</p>

		RCP 8.5 climate scenario. While Golder is not aware of any regulatory requirement to consider the RCP 8.5 scenario, it would be considered best practice to consider this scenario in the next phase of design (subject to planning approval) to (i) better understand the potential range of surface water concentrations during closure, and (ii) reflect the uncertainty inherent in climate change predictions.
9	4.3	<p>Assessment of associated levels of uncertainty</p> <p>It is noted there is a lack of discussion pertaining to the uncertainties associated with the inputs to the closure calculations. Several sources of uncertainty have been identified based on the review of the “Surface Water Impact Assessment for the Curraghinalt Gold Project, County Tyrone, Northern Ireland” report:</p> <ul style="list-style-type: none"> • Flows in the receiving water bodies; • Discharge flows from the mine site; • Baseline water quality (in receiving water bodies); • Water quality of source terms for mine water discharges. • Climate Change <p>Golder notes that consideration has been given to the uncertainty in climate change predictions, through the consideration of the RCP 4.5 climate change scenario in the dilution calculations. However, Golder notes the lack of discussion pertaining to the uncertainties associated with water quality and flow inputs to the closure calculations.</p>
10	4.4	<p>Assessment of sensitivity analysis of the inputs and outputs</p> <p>No sensitivity assessments were carried out for closure, for either the Owenreagh or Owenkillew catchments.</p> <p>As stated in Section 4.3, when carrying out water quality calculations, it is considered good practice to carry out a sensitivity analysis regarding both flows and qualities. The exclusion of this sensitivity analysis has no bearing on the validity of these calculated qualities. However, sensitivity analyses should be carried out in the next phase of design (subject to planning approval), to better understand the potential range of surface water concentrations during closure in the Owenreagh and Owenkillew Catchments.</p>

Table 2**DALRADIAN PROPOSED CURRAGHINALT GOLD MINE PROJECT - WATER
BALANCE REVIEW (Golders, 8 March 2021)**

No:	Golders Doc Ref:	Issue
1	4.3	<p>Conceptual Models</p> <p>Based on the available information, the conceptual models represent all key infrastructure and flows on site and the physical environment to an adequate resolution.</p> <p>Golder notes that it would be helpful if a legend item was included which clearly identified that net rainfall on the ponds in Figures 14, 15 and 16 in "Curraghinalt Gold Mine Project - Site Water Balance - 2020 Update". However, the omission of this legend item does not affect the outcomes of the water balance review.</p> <p>The conceptual models represent all key infrastructure and flows on site and the physical environment to an adequate resolution. Whereas some additional clarity could be added to in terms of reporting the conceptual models, this does not affect the outcomes of the water balance review.</p>
2	4.5	<p>Golder identified that monthly timeseries inputs are not appropriate for assessing compliance with daily river flow standards in Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015. However, further assessment of the mine discharges which takes daily inputs into account, while being helpful, is not expected to change the overall results from the water balance, which indicates monthly and annual flows in the Pollanroe Burn are augmented during low and average flow conditions.</p> <p>Golder also identified that the modelled flow duration curve for natural catchments under predicts low flows and over-predicts high flows. While further discussion on the implications (if any) of this would be useful, Golder considers the representation of runoff within the model to be adequate given that sensitivity analyses were carried out to address uncertainties in runoff rates. Therefore, Golder considers that the inputs and assumptions of the water balance are appropriate and does not consider that any further assessment is required at this planning stage.</p>
3	4.7	<p>Uncertainty in Model Inputs and Outputs</p> <p>The possibility exists that a higher compensation flow may be required by the permitting process; however, as increased flows are provided to the Pollanroe Burn, there is confidence that increased demands for</p>

		<p>compensation flows could be met. It is noted that no sensitivity analysis assessment has been carried out to assess to what extent increased compensation flow demands could be provided from the Clean Water Pond. However, the exclusion of this assessment does not affect the validity of the results from the Base Case.</p>
4	4.8	<p>Sensitivity Analysis of Model Inputs</p> <p>Some gaps in the sensitivity analysis assessments were noted and are summarized as follows:</p> <ul style="list-style-type: none"> • Sensitivity Analysis S1-6 (Daily Hydrological Timestep) considers daily runoff and seepage inputs, but monthly rainfall and evaporation inputs. • Sensitivity Analysis S1-7 (Daily Hydrological Timestep in Addition to Increase in Runoff by 20%) considers daily runoff and seepage inputs, but monthly rainfall and evaporation inputs. • Justification of the range of values considered in Sensitivity Analysis S3-3 (Increased Loss to Evaporator in the RO Treatment Plant). • Assessment of the impacts of diverting runoff from undeveloped areas to Pollanroe Burn modelled in Sensitivity Analyses S4-1 (Divert Natural Runoff in Western Diversion Channel to Pollanroe) and S4-2 (Runoff from Undeveloped Areas of DSF Released to Pollanroe), in the event of planning or operational changes
5	4.11.1	<p>Maintenance of Low Flows</p> <p>However, the water balance does not take account of daily variations. The “Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015” outlines permitted daily abstraction rates as a percentage of natural mean daily flows. In the event that compensation flows are required to meet these river flow standards, discharge from underground workings can continue to be pumped at rates that allow the standards to be met. Further assessment of the mine discharges (taking daily inputs into account), while being helpful, is not expected to change the overall results from the water balance.</p>
6	4.11.2	<p>Reduction of Erosion</p> <p>Given that the discharges to the Pollanroe Burn from the proposed infrastructure site would be controlled and limited to the water treatment rate during flood events (which is lower than the baseline 2-year flood flow of 900 L/s), it is Golder’s opinion that the increase in flows reporting</p>

		to the Pollanroe Burn is unlikely to increase the risk of accelerated erosion in the channel. It is Golder's recommendation, however, that during the detailed design stage, hydraulic analysis of the Pollanroe Burn be undertaken to assess the need for any required erosion protection controls within the channel itself. Golder also recommends proper engineering design be applied to the outfall locations at Pollanroe Burn (East Diversion and Water Treatment Plant outfall) during the detailed design stage, to reduce risk of erosion in the channel at these locations.
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Table 3		
DALRADIAN DSF AND POND SEEPAGE REVIEW COMMENTS (Golders, 5 March 2021)		
No:	Golders Ref:	Issue
1	2.1	<p>Model code selection.</p> <p>The seepage from the ponds is reported to have been undertaken in Microsoft Excel incorporating Palisade's @Risk2 Monte Carlo add-in to facilitate probabilistic modelling. The relevant Excel spreadsheets have not been provided for review.</p>
2	2.2	<p>Assumptions</p> <ul style="list-style-type: none"> • It is stated that the precipitation and evapotranspiration for 2016 as representative of an average year for the purpose of their recharge calculation. It appears this is based on calculation of mean precipitation, with 2016 being representative of a mean year, and does not account for any long term trends resulting from climate change. No further justification has been given for this. • The modelling work has not considered the impact of climate change on recharge to the facility. Given the models are run for a 1,000 year time period, consideration to the impact of climate change (e.g. RCP 4.5 and 8.5) should be made. SRK state in the report that the model is not sensitive to variations in climate inputs and on this basis, have not simulated the impact of climate change. It is considered that this approach is acceptable on the basis that the model is used as a risk assessment tool rather than a design or performance model, where the impacts of climate change, albeit potentially limited, may be of importance.

		<ul style="list-style-type: none">• The recharge calculation is time invariant in that it is assumed that infiltration through the cover in year 10 will be the same as that in year 100 or 1000. SRK state that the infiltration change due to climate change will not be significant and that the model is relatively insensitive to variations in recharge. On this basis they have not simulated the change in infiltration due to climate change. It is considered that this approach is acceptable on the basis that the model is used as a risk assessment tool rather than a design or performance model. It is noted however that some changes in soil cover condition that may occur over time, for example the potential for by-pass flow may increase over time as vegetation cover become established, with associated root penetration, and or borrowing activity occurs.• The applicant makes a number of assumptions with regard to the percentage of runoff that will occur from the facility during rainfall events. It is stated in Section 3.2.2 that “<i>The run-off factors were calibrated to achieve a runoff in the range of 55% based on the HOST 19 classification for impermeable soft substrates with high water storage.</i>” Golder notes that based on the description used, the HOST classification should be 20 based on IOH, 19954. The stated use of HOST 19 may be a typographical error, however the applicant should be requested to confirm the classification stated and the address the consequent impact of any changes in the assumptions. It is not considered that the impacts of any changes will materially alter the outcomes of the study.• The applicant used calculated unsaturated flow parameters based on calculating a soil water characteristic curve (SWCC) using an empirical method that draws on a database of statistical correlations between particle size distributions and measured SWCCs. This method is encoded in RETC, which is derived originally from the US Soil Salinity Laboratory’s Rosetta code, which is embedded within Hydrus-1D developed by PC-Progress. While this approach is standard practice and may give appropriate values, future consideration should be given to undertaking laboratory measurements to derive a SWCC.
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Regulation Unit

Planning Reference: LA10/2017/1249/F

Application Address: “Lands NW Of Greencastle E Of Rouskey N Of Crockanboy Rd W Of Mullydoo Road N And S Of Camcosy Rd Including Lands 165m W Of No. 45 Camcosy Road To The Junction Of Camcosy Rd And Crockanboy Rd And Lands 47m To The SE Of 73 Crockanboy Rd”

Section Reference: AE1/21/138449

Considerations

Regulation Unit (Waste Management Licensing Team) were consulted on the waste management impacts of the proposal and provides comment that NIEA is not the competent authority with regard to the Mining Waste Management for this proposed facility. This is regulated by the relevant Planning Authority.

Regulation Unit, Land and Groundwater Team (LGW) has considered the impacts of the proposal on the groundwater environment and further clarification is recommended. This is detailed within the explanatory note.

Explanatory note

The comments below are not exhaustive but serve to capture key points in support of the Regulation Unit's position outlined above. These comments are made on consideration of the documents listed in **Annex 1**.

1. The following is recommended:
 - Clarification regarding the use of proposed groundwater standards for compliance monitoring of hazardous substances. The compliance monitoring of groundwater stipulated uses one of the recommended UKTAG approaches where “*concentrations in groundwater below which the danger of deterioration in the quality of the receiving groundwater is avoided*”. This approach should be interpreted as at the point of input for the receiving groundwater, and assessed prior to mixing (typically the base of the unsaturated zone) i.e. dilution in groundwater should not be taken into account. In scenarios where sources are input below the water table compliance should be assessed at the point of entry to groundwater. Therefore consideration and clarification regarding the standards used and the location of compliance monitoring for hazardous substances within groundwater, with further justifications, are recommended.
2. Further supporting information may be required during the consent/licensing process in relation to groundwater, this includes (but is not limited to) consideration of the impact from the groundwater abstraction on the quantitative status of the related groundwater body.
3. Regulation Unit, LGW note that as part of the closure plan for the site and finalisation of the closure aspects of “*Surface Water and Groundwater Environment Monitoring and Action Plan*” may require a groundwater authorisation, in accordance with the

Regulation Unit

Groundwater Regulations (Northern Ireland) 2009. This is in relation to the input of mine water to the surrounding groundwater environment post closure during mine water rebound.

Regulation Unit

Annex 1

Documents listed in 2020 Response

- A. SRK Consulting: Curraghinalt Gold Project Addendum to Environmental Statement, Prepared for Dalradian Gold Limited; dated July 2019;
- B. SRK Consulting: Curraghinalt Project County Tyrone; Prepared for Dalradian Gold Limited, An Addendum to the Hydrogeology Baseline Report for the Curraghinalt Gold Project, Northern Ireland; dated July 2019;
- C. SRK Consulting: Curraghinalt Project County Tyrone; Prepared for Dalradian Gold Limited, Draft surface water and groundwater environmental monitoring and action plan, Curraghinalt Project, Northern Ireland; dated July 2019;
- D. SRK Consulting: Environmental Emergency Preparedness and Response plan protocol for the Curraghinalt Project, County Tyrone, Northern Ireland; Prepared for Dalradian Gold Limited; dated July 2019;
- E. SRK Consulting: Letter entitled “RE: UK7511 – Clarifications to the Environmental Statement Addendum – DAERA Land and Groundwater Team”; Dated 06 April 2020. Clarification Questions Ref no. 1 – 5.

Additional Documents in 2021 Response

- F. SRK Consulting: Curraghinalt Gold Project Second Addendum to Environmental Statement, Prepared for Dalradian Gold Limited; dated October 2020;
- G. SRK Consulting: A Geochemical Characterisation Report for The Curraghinalt Gold Deposit, Northern Ireland; Prepared for Dalradian Gold; dated October 2020. (Appendix C of 2020 Mine Waste Plan);
- H. SRK Consulting: Groundwater Impact Assessment for The Curraghinalt Gold Deposit, Northern Ireland; Prepared for Dalradian Gold; dated October 2020. (Appendix I of 2020 Mine Waste Plan);
- I. SRK Consulting: Surface Water Impact Assessment for The Curraghinalt Gold Deposit, Northern Ireland; Prepared for Dalradian Gold; dated October 2020. (Appendix J of 2020 Mine Waste Plan);
- J. SRK Consulting: Surface Water and Groundwater Environmental Monitoring and Action Plan October 2020 Draft (Version 2) Curraghinalt Project; Prepared for Dalradian Gold; dated October 2020. (Appendix K of 2020 Mine Waste Plan);
- K. SRK Consulting: Waste Management Plan for The Curraghinalt Project, County Tyrone, Northern Ireland; Prepared for Dalradian Gold; Dated October 2020;
- L. RPS: Addendum to the Assessment of Radon Gas and Norm Emission Impacts, dated July 2019;
- M. Kaya Consulting Ltd: Proposed Mining Development for the Curraghinalt Project, County Tyrone, Northern Ireland, Flood Risk and Drainage Assessment; dated October 2017;
- N. SLR: EIA Baseline Data Collection: Soils and Geology, prepared for Dalradian Gold, dated May 2017;
- O. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN PROPOSED CURRAGHINALT PROJECT GROUNDWATER MODELLING REVIEW”, dated 27th January 2021, to Graeme Walker, Department for Infrastructure, From Peter Corrigan;

Regulation Unit

- P. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN PROPOSED CURRAGHINALT PROJECT – WATER BALANCE REVIEW”, dated 28th January 2021, to Graeme Walker, Department for Infrastructure, From Peter Corrigan;
- Q. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN PROPOSED CURRAGHINALT PROJECT PHREEQC MODELLING REVIEW”, dated 27th January 2021, to Graeme Walker, Department for Infrastructure, From Peter Corrigan;
- R. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN PROPOSED CURRAGHINALT PROJECT SURFACE WATER QUALITY REVIEW”, dated 1st February 2021, to Graeme Walker, Department for Infrastructure, From Trevor Montague;
- S. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN DSF AND POND SEEPAGE REVIEW COMMENTS” dated 27th January 2021, to Graeme Walker, Department for Infrastructure, From Peter Corrigan;
- T. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN PROPOSED CURRAGHINALT PROJECT PHREEQC MODELLING REVIEW”, dated 5th March 2021, to Graeme Walker, Department for Infrastructure, From Peter Corrigan;
- U. Golder Associates (UK) Ltd: Technical Memorandum entitled “DALRADIAN DSF AND POND SEEPAGE REVIEW COMMENTS” dated 5th March 2021, to Graeme Walker, Department for Infrastructure, From Peter Corrigan.

Natural Heritage

Section Reference: CB25686-3

Planning Reference: LA10/2017/1249/F

Date of NED response: 8 March 2021

Considerations

NIEA Natural Environment Division (NED) has concerns with this proposal and considers that, in the absence of further information, the proposal would be contrary to the Planning Policy Statement 2: Natural Heritage and the Strategic Planning Policy Statement for Northern Ireland in that the development would have an unacceptable adverse impact on designated sites and insufficient information has been submitted to establish otherwise.

NED acknowledges receipt of the Curraghinalt Project Update Shadow Habitats Regulations Assessment, November 2020, date stamped 4 November 2020 by the Planning Authority.

Designated Sites

The Owenkillew River was afforded SAC protection under The Conservation (Natural Habitats, etc.) Regulations 1995 (Northern Ireland) (as amended).

Note: To ensure The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) are operable after the end of the EU transition period, changes were made by The Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019. The changes are largely procedural, affect government and include the transfer of functions from the European Commission to DAERA.

DAERA has a duty to have regard to the requirement to maintain conservation measures of SACs and SPAs so that the habitats within the national site network sites do not deteriorate, conservation objectives for each European site are met, and the species for which these sites have been designated are not significantly disturbed.

For this reason, competent authorities, such as Public Bodies with legal powers to issue permission such as Planning Authorities and Government Departments can only agree to plans or projects which are not connected to the nature conservation management of the site after they have ascertained that they will not adversely affect the integrity of the site.

The draft Protected Area Conservation Management Plan for the Owenkillew River SAC/ASSI 2021-2031 has an overall aim to identify and put in place workable and realistic measures at the appropriate scale to deliver the conservation measures of these sites to ensure their long-term sustainability.

The population of Atlantic Salmon is particular importance in the Foyle system: it is one of the largest such populations in Europe. Research has indicated that each sub-catchment within the system supports genetically distinct populations. The area is also important as a river habitat. In their upper catchments: the rivers are all fast-flowing spate rivers with dynamic flow regimes characterised by sequences of rapid, riffle and run. The Owenkillew River and the River Foyle and Tributaries SAC are not only hydrologically linked but ecologically integrated with smaller tributaries within the catchment of the SAC, which are also very important ecological resources for Atlantic Salmon in particular. Therefore, to ensure protection to the conservation status of the qualifying habitats and species, it is critical that the management of both SACs is undertaken through an integrated, catchment based approach.

Natural Heritage

Given the need for a catchment based approach to the management of the Owenkillev River SAC, the management of the SAC cannot be effectively implemented without consideration of the land use and activities that take place within the various sub catchments that drain to the tributaries and main channel of the Owenkillev River.

This catchment scale approach is essential in order to strive to meet the conservation objectives of the site for both the Freshwater Pearl Mussel and the Atlantic Salmon, which are to maintain and, where possible, enhance the extent and quality of suitable habitats and maintain and if possible expand, existing population numbers and distribution.

Salmon and freshwater pearl mussel have a closely linked life cycle, with juvenile salmon acting as an intermediate host during the larval stage of the life cycle. The relationship of pearl mussels and salmon is symbiotic. The fish provides the essential step in the mussels' life cycle, and mussels improve water quality by filtering water. On this basis, the management of both species and the application of measures to improve their conservation status will be complimentary.

This catchment scale approach is in line with, and is complementary to, advice and guidance received from Loughs Agency who have responsibility for fisheries. Following site walkovers of both receiving Burns with Loughs Agency on 11 February 2021, NIEA received their expert opinion that both the Curraghinalt Burn and Pollanroe Burn contain suitable Salmon habitat.

1. Elevated levels of suspended solids (above 10mg/l) in the water column are detrimental to the Atlantic Salmon feature, resulting in gills being smothered or impeding their passage upstream. Sediment can also smother the gravels used by spawning salmon by infilling of interstitial spaces and leading to reduced oxygen flow across the spawning bed. Nursery habitats can become seriously infiltrated with silt depositions, thereby reducing the habitat quality and/or diversity and abundance of invertebrate food organisms. Additionally, these impacts may also indirectly affect the Otter feature population structure through interference with key components of their ecology.

Following on from the advice received from Loughs agency with regard to available Salmon habitat in both the Curraghinalt and Pollanroe Burns and the Catchment scale approach with regard to protecting the Owenkillev SAC, NED require that discharge consents for both Burns are set targets of an annual mean of <10mgL⁻¹ (spawning & nursery grounds).

It is therefore deemed necessary that these levels for suspended solids are met 40m upstream of the confluence between the Curraghinalt Burn and the Owenkillev River and 1.2km upstream of the confluence of the Pollanroe Burn and the Owenreagh River, and not as previously modelled at the confluences in order to comply with the SAC Habitats Regulations Conservation Objective targets for Atlantic salmon.

2. NED Acknowledge the submitted Conceptual Closure Plan and welcome the fact that it will be an active plan that will be revisited during the life of the mine, with changes in legislation and closure priorities incorporated into the detailed plan that will be developed before the mine ceases operation.

The shadow Habitats Regulations Assessment (sHRA) has included consideration for any potential significant effects which could arise during the closure/restoration phase of the proposal and determined no likely significant effects.

Natural Heritage

The Golder Associates report comments on the seepage review from both the Dry Stack Facility and the ponds at the Proposed Infrastructure Site during the post-closure phase, which are modelled to be not significant. It states: "It is considered unlikely that any of the issues raised will significantly impact on the model results with regard to the magnitude of calculated pore pressures or seepage from the facility."

NED would re-iterate that all modelling should indicate that Water Quality standards for Atlantic Salmon should be met at specific points in both Burns as detailed in Point 1, above.

3. NED welcomes the submission of an updated Surface Water Impact Assessment, which discusses flows and flood peaks. It states that discharges to the Curraghinalt Burn are predicted to be lower than baseline conditions due to the diversion of adit water to the proposed infrastructure site and small reductions in baseflows to the burn.

Discharges from the mine infrastructure area could cause changes to the channel banks of the Pollanroe Burn and Owenreagh River close to the confluence, with the former due to erosion of banks or channels within the watercourses.

Annual hydromorphological surveys of the Pollanroe Burn confluence will be undertaken by a geomorphologist and will include a photographic survey of the channel. The first survey will be undertaken prior to construction activities and will be performed at a similar time every subsequent year, until otherwise agreed with regulations.

The sHRA gives consideration to the hydrogeological and hydrological regime and concludes no LSEs. The Golder's report on the Water Balance Review concludes that although there is a need for further clarification to correct some erroneous model inputs and sensitivity analysis assessments, particularly regarding climate change, it is not anticipated that the overall results would change substantially.

However, given that there is 1.2km of Salmon habitat above the confluence of the Pollanroe Burn and Owenreagh River and 40m of Salmon habitat above the confluence of the Curraghinalt Burn and Owenkillow, NED requests further information to eliminate any likely significant impacts of potential changes to the hydrological regime to include the potential for scouring at these points and further downstream towards the confluences.

4. With regard to the updated Peat Management Plan and Peat Landslide Hazard Risk Assessment document, NED is currently awaiting independent review of these documents to include a review of the Dry Stack Facility and is therefore unable to make further comment at this time. As such, we will address these documents in due course.
5. NED welcomes the Second Addendum to the Environmental Statement which discusses the AQIA and sHRA which has a finding of no likely significant impacts arising as a result of vehicle emissions. NED are content that these results are in line with DAERA Operational Protocol on Nitrogen Emissions.
6. NED acknowledges that various studies have been carried out to determine the potential impacts associated with constructing and operating a powerline to the site. As the powerline is associated and interdependent with the main planning proposal, NED require confirmation that the potential impacts on the features of Owenkillow SAC of both projects will be considered in combination.

Natural Heritage

7. NED has reviewed the comprehensive geochemical characterisation study that has been undertaken which demonstrates very low potential for any generation of acid drainage in line with the mitigation measures. This report also details how waste rock showing potential for acid generation will be placed underground within mined out stopes and encapsulated in cemented paste backfill.

Golder Associates have also reviewed the submitted reports and have confirmed that the acid rock drainage model used is fit for purpose. As such, NED are content with the evidence provided.

8. NED acknowledges the commitment to monitor vibration and noise impacts on salmon to Alaskan industry standards. However, no mitigation measures for spawning salmon are described in the ESMP as stated. NIEA recommend that these mitigating measures are included within a final CEMP.
9. NED welcomes the commitment to develop a final CEMP with input from NED prior to commencement of works, along with an agreed suite of reporting parameters and reporting mechanisms. Requirements will be agreed with DFI in line with associated consenting and permitting conditions.

Please also note, as discussed above and in previous responses, that the impact of this development upon the water environment (quality and resource) and therefore the impact upon the designated sites and associated features cannot be fully determined until:

- The outcome from the DfI consultancy procurement process has been completed and reported;
- Environmental authorisations, namely Discharge Consents and Abstraction Licences, have been assessed and determined by NIEA, supported by Habitats Regulation Assessments.

Once the outcomes from these identified areas of work are known, NED will be in a position to make a fully informed substantive response to this planning application.

Other Natural Heritage Considerations

NED provided advice regarding impacts to non-designated Natural Heritage features within the site in previous two responses.

NED has no concerns regarding impacts to non-designated Natural Heritage features, but as stated in our previous responses, some features will require conditions to be included in the final decision notice to ensure that these features are not adversely impacted. NED will provide these conditions in the final DAERA response.

Protected Landscapes

NED has considered all relevant landscape-related documents (or landscape sections within larger documents) in the most recent submission relation to this application (all received by DfI Strategic Planning Division on 04/11/20).

For completeness, these are:

- UPDATED ES(2) Vol – Non-Technical Summary
- UPDATED ES(2) Vol 2 – Addendum to Environmental Statement
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 1

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- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 2
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 3
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 4
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 5
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 6
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 7
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 8
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 9
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 10
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 11
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 12
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 13
- UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA –App 1 Part 14
- UPDATED ES(2) Vol 3 App C17 Updated Landscape and Restoration Plans
- UPDATED ES(2) Vol 3 App 23f – Landscape and Visual Impact Screening Assessment
- UPDATED ES(2) Vol 3 App E9 – Project Description Update

Our considerations based on all the documents supplied are as follows (Part numbers are included where applicable. The absence of some not being referenced in our reply means that no comment was necessary or comment would only replicate other points and considerations already made):

UPDATED ES(2) Vol – Non-Technical Summary:

3.2.1 Landscape and Visual p 10-11

We would broadly agree with the following statements contained therein:

“The proposed landform of the DSF will have an improved shape and appearance, in aesthetic terms, and will integrate better with the AONB landscape, but will still present a significant alteration to the present landform, character and views, as set out.

Once the site has been restored, with structures, associated lighting, and areas of hardstanding removed; land cover returned to heath and grassland; and new woodland planting introduced to replace non-native sitka spruce trees, the permanent and lasting effects on landscape character and views are likely to be reduced.”

3.3 ES Conclusions

3.3.1 Overview

“ Negative impacts that remain significant following the implementation of mitigation measures relate to:

Adverse landscape effects and visual impacts on certain representative viewpoints, residential properties and routes local to the project site”

UPDATED ES (2) Vol 2 – Addendum to ES

Main Report : Landscape receptors p. 28

We would broadly agree with the following statement contained therein:

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“The assessment of effects on the landscape character of the Sperrin AONB is based on the assessment of the South Sperrin LLCA that covers the extent of the AONB within the study area. Whilst there will be significant effects on the landscape and views within the South Sperrin LLCA, the landscape effects are not judged to ‘unduly compromise the integrity of the area as a whole or threaten to undermine the rationale for the designation.’”

UPDATED ES(2) Vol 3 App C16 – 2nd Addendum to the LVIA – App 1:

Part 2: The ZTV for the DSF at year 4 shows how wide the visual envelope would be, ostensibly to the South and South-West of the site. It also confirms that the overall impact on the AONB to the North would not be significant.

Part 5: Figure A9.1 Viewpoint 1: The proposal looks artificial and incongruous in the landscape from this viewpoint, particularly at years 4 and 8 with straight lines and sudden break of slope.

Part 8: Figure A9.4: Viewpoint 4: as above

Part 6: Figure A9.2 Viewpoint 2: Again the colour of the Covered ROM Stockpile should be reconsidered. The other componentry buildings look more acceptable than in other photomontages in the 2nd Addendum to the LVIA. Although it would undoubtedly be a net gain to remove the non-native conifer lines evident in the photomontages, the replacement planting should be more natural and organic in form, except where it is intended to replace or replicate field patterns in the immediate vicinity. In other words it is perhaps not necessary to substitute straight lines for more straight lines of planting.

Part 9 Greencastle Road: Daylight and Dusk photomontages: Viewpoint 5: The profile along the ridgeline of the DSF remains straight and flat on top and the pinch point on the RHS still appears to be angular and straight-edged before it merges with the existing landscape profile. We realise this may be an inevitable consequence of early construction work but it nevertheless remains an issue.

It would assist the assessment process if we had a few visuals of how the proposal will look prior to year 4 i.e. a short LVIA of operational years 1-3 when impacts arguably may be more acute.

Although with time the proposal will be softened as indicated in the photomontage by Year 20 and post closure (and there will be a net benefit to landscape character with the removal of the Sitka Spruce/Lawson Cypress), the planting still appears to be fairly formal in design and therefore appearance. The photomontages still show a straight line of planting at the base of the DSF and the wedges of planting going up the slopes look artificial, accepting that computer imagery can do this. Consideration should be given to making them look more ‘natural’ however. They look too regularly spaced out in our opinion.

The photomontages at dusk are useful and appear to indicate a low level of impact from ambient light and light spillage. We would appreciate confirmation that there will be no additional lighting along the haulage route and entrance to the site. This doesn’t seem to be picked up in the photomontages if this is the case.

Part 10: Figure A9.6 Viewpoint 6: Although the finished profile looks reasonable, in the intervening years before removal of the site componentry, the proposal still looks incongruous from this viewpoint (and in all likelihood its vicinity). The buildings, in particular the Processing Plant and

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Maintenance Workshop, will be prominent and some profiles and angles at the edges of the DSF appear acute and unnatural.

Part 11: Figure A9.7 Viewpoint 7: Aghaboy Road: The Year 4 photomontage shows that the light green circular covered ROM stockpile, which is part of the proposed site componentry, when seen against the dark green of the conifers behind presents a problem as it clashes and is incongruous in the landscape.

Part 13: Figure A9.9 Viewpoint 9: This shows that the Site Componentry elements the Covered ROM Stockpile and the Processing Plant building sits proud to the rear of the DSF and these are indicated as evident at all operational years until decommissioning and final removal. They would therefore be of concern when traveling through this landscape from this direction. The outline, colour and finish of these components will be crucial and we would recommend more subdued darker colours are used than shown, accepting again that computer generated imagery can look artificial. In terms of levels, and there are obvious engineering, constructional and operational implications, consideration should be given, if it hasn't been already, to setting these components down into the landscape more to achieve more visual integration.

Part 14: Viewpoint 10: Davagh Forest: This shows apparently no ambient light or light spillage from a single representative viewpoint. Whilst this is favourable, the suite of landscape documents show only low level lighting from one section of the site componentry buildings (as mentioned in Part 9 above) and it is stated that this lighting would be little different from farmsteads on the hillside in darkness. We would appreciate if this were confirmed.